

## ABSTRACT OF THE DISCLOSURE

[0078]     Ultrasound transducer temperatures are measured in response to a temperature dependent property of the ultrasound transducer. The temperature is measured without addition of new electronics or hardware retrofits of the transducer. By implementing software and/or hardware on the ultrasound system rather than the transducer, the temperature is measured in order to provide a level of fault protection. The upgraded or new ultrasound system uses either old or new transducers while still providing temperature measurement. For example, the temperature of the lens or window is measured as a function of changes in attenuation or acoustic velocity. The receive beamformer already implemented on many ultrasound systems is used to measure a temperature dependent property of the lens or window. As another example, the dielectric constant or capacitance of one or more transducer elements is measured using additional hardware in the ultrasound system. The signal line and associated cable for one or more piezoelectric elements is switchably connected between hardware for measuring a capacitance and the receive beamformer for imaging. Rather than temperature, the operational state of the transducer may be diagnosed using acoustic energy response of the lens.